THE INSTITUTE OF MEDICINE FRAMEWORK AND ITS IMPLICATION FOR THE ADVANCEMENT OF PREVENTION POLICY, PROGRAMS AND PRACTICE

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CENTER FOR APPLIED RESEARCH SOLUTIONS

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ABSTRACT

The Institute of Medicine (IOM) categorization of prevention into universal, selective and indicated populations has been widely adopted in the prevention field, yet the terms are not precisely or uniformly applied in practice. In this paper, the strong potential for the IOM categories to bring a unifying framework to currently fragmented strategies and practices in prevention is furthered by carefully identifying the underlying implications of these population categories for identifying and recruiting participants, selecting interventions that are effective, anticipating attainable positive outcomes and avoiding potential unintended influences. Systematically applied, the IOM framework can be a valuable tool for creating a conceptually unified and evidence-based continuum of prevention services.

INTRODUCTION

Prevention is an encompassing policy concern in public health. As applied to substance abuse, prevention can be defined broadly as policies, programs and practices designed to reduce the incidence and prevalence of alcohol and other drug abuse and consequent health, behavioral and social problems. Prevention services focus on a broad population -- persons who have not yet experienced serious negative consequences, or inflicted serious social harms, associated with abuse of substances. Like so many policy purposes, prevention objectives have broad appeal. However, to provide clear guidance for policy, program and practice design and implementation, the broad prevention concept requires clear logical and empirical definition. Paradoxically, the very popularity of a broad policy term in public debate can obfuscate critical distinctions and limitations because stakeholders invoke the term to serve preferred policy objectives. As pithily stated two decades ago, "(p)revention is a concept in vogue. As a result, the term is, at best, ill-defined and misused" (Seidman, 1987, emphasis added).
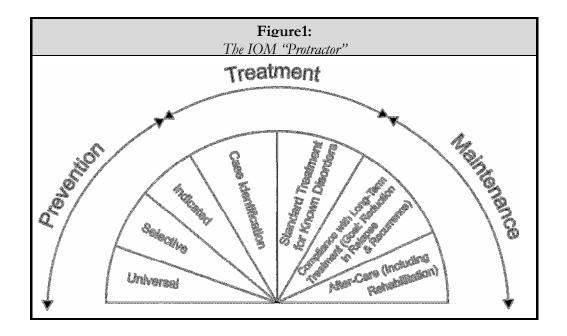
In the past two decades the prevention field has progressed and matured. Evidence-based knowledge concerning the prevention of substance abuse has grown, producing greater understanding of the factors that contribute to the initiation and growth of alcohol, tobacco and other drug use at individual, family, school and community levels. Importantly, knowledge about evidence-based practices and programs that are effective for different populations has also grown significantly. However, knowledge about what works is based on evaluation results produced largely through studies of individual programs diverse in approach, specific objectives and participants. Knowledge of factors contributing to substance abuse and associated problems is fragmented, as is evidence concerning effective prevention policies, programs and practices.

In summary, the prevention field has not yet matured to the point of developing an overall theoretical framework that relates knowledge about risk for substance abuse, causal contributors to substance abuse and effective intervention. Different approaches are often posed as alternatives rather than complements, and prevention policy makers and practitioners experience confusion concerning the selection and application of evidence-based practices. An encompassing framework that facilitates systematic comparison of outcomes, interventions, and resource requirements is essential to meet the growing desire for informed planning, evidence-based policy and practice, and monetary accountability in the prevention field.

This article expounds the Institute of Medicine continuum of health services as a promising framework to integrate the prevention field. The IOM framework places prevention in a graded continuum of care that distinguishes between prevention, treatment and maintenance, and shows their interrelation. It also distinguishes between three levels of prevention services according to the risk levels of the target populations. The IOM framework has been visibly adopted in prevention policy language, but its implications for policy and practice have not been fully developed or explored in detail. Seidman's (1987) observation from two decades earlier remains applicable – as the IOM categories have come into vogue, their application has been loosely defined, and sometimes contentious. In this article, the premises of the original formulation of the IOM framework are reviewed, and limitations of its current application are discussed. To clarify the utility of the IOM categories for meeting the need for a unifying conceptual framework in prevention, the definition of populations, recruiting of participants, identification of appropriate interventions, and specification of appropriate outcomes are discussed within universal, selective and indicated prevention categories.

BACKGROUND: ORIGINS AND PREMISES OF THE IOM FRAMEWORK

In 1994, the Institute of Medicine recognized the need for a framework for health planning that went beyond the distinction between primary (prevention), secondary (intervention), and tertiary (treatment) phases then in use. The Institute commissioned development of the framework summarized in the IOM "protractor" (Figure 1). The framework was adapted from the universal, selective and indicated service population categories defined by Gordon (1987). The protractor depicts a graded series of need and service from the prevention of health or behavioral health problems, through the treatment of a chronic condition, to the maintenance of a managed healthy status. This continuum of care model has several advantages over the older primary, secondary, tertiary conceptualization. First, intervention phases defined as prevention, treatment and maintenance are descriptive of the different service needs that occur in each phase. Second, distinctions between each of the three phases are more clearly identifiable than in the old categories that assumed clear distinctions in disease progression. For example, in the IOM framework treatment begins only when case identification (diagnosis) is achieved. With respect to substance abuse, prevention can be concretely defined as all services provided prior to a specific diagnosis of abuse or dependence – treatment comes after. Third, the IOM framework provides additional phased distinctions in activities within prevention, treatment and maintenance.

Figure1:
The IOM "Protractor"

The prevention arc is divided into universal, selected, and indicated prevention activities. While Gordon's work focused on physical health his ideas were received as particularly suitable for planning prevention of behavioral health problems such as substance abuse, mental health, eating disorders, obesity, problem gambling, and their associated mix of personal and social harms. These behavioral health problems all have multiple individual and environmental risks as precursors. The risk and protective factor framework had gained great currency because it was readily demonstrated and had intuitive appeal (Hawkins et al, 1986; Hawkins et al, 1992). The development of substance abuse and other behavioral health problems is characterized by complex relations between these multiple risks and the progression of the diagnosable disease state (e.g., substance dependence).

In contrast to the earlier focus on disease etiology, Gordon's (1987) focus on risk was based in epidemiology which "… regards the individual as a 'black box,' and collects data only on the outwardly observable forces that influence the individual and the state(s) of health or disease that follow."

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This paradigm fits nicely with the growing empirical focus on risk factors as a way of focusing preventive interventions for substance abuse, and it provides a systematic conceptual framework for developing evidence-based knowledge on matching intervention to participants at progressive degrees of risk.

Current Applications of IOM in Substance Abuse Prevention

When the Institute of Medicine endorsed its new framework for a continuum of care, the committee noted that its application to behavioral health "is not straightforward" (Mrazek & Haggerty, 1994). Primary issues included the need for a clear definition of the distinction between prevention and treatment, the relation between prevention of behavioral health disorders and promotion of wellness, and the clear identification of actions (interventions) appropriate to each population. Notwithstanding these caveats, the IOM categories have been adopted in the language of prevention planners, policy makers and funding agencies. The three categories are widely used to classify target populations, intervention strategies, and specific interventions. With respect to substance abuse and mental health prevention, Robinson et al (2004) adapted typical definitions (Kennedy, 1999).

1. Universal preventive interventions: Addresses general public or a segment of the entire population with average probability of developing a disorder, risk, or condition.

2. Selective preventive interventions: Serves specific sub-populations whose risk of a disorder is significantly higher than average, either imminently or over a lifetime.

3. Indicated preventive interventions: Addresses identified individuals who have minimal but detectable signs or symptoms suggesting a disorder

This definition applies the categories to "interventions", implying that the IOM framework is a classification of different types of interventions. This assumption is widely accepted in current uses of IOM. For example, a recent and widely disseminated training program (WCAPT, 2005) directs prevention planners to "identify what type of strategy you need to employ: universal, selective or indicated." (emphasis added) In another example, programs that have received model status within SAMHSA's National Registry of Effective and Proven Programs (NREPP) are organized by IOM category. However, there are no formal criteria for determining to which category a given intervention should be assigned, so the designation is self-assigned by intervention developers. In still another example, prevention programs (WCAPT, 2005) are assigned to multiple categories (e.g., one program may be listed as universal and selective, or as selective and indicated). The lack of criteria for assignment of policies, programs or practices to IOM categories seriously limits the usefulness of the labels for guiding selection and implementation of appropriate interventions.

The uncertainty of definition means that IOM categories are subject to varying interpretation. For example, NIDA clearly states that indicated programs are preventative and serve populations "who do not meet DSM-IV criteria for addiction, but who are showing early danger signs." However, the Office of Substance Abuse Services in Virginia has interpreted indicated services to be outside of prevention, and has clearly stated that "SAPT prevention set-aside funds may not be used to support Indicated prevention programs" (Guidance Bulletin No. 2003-03). Other states face opposition to funding indicated prevention because it may overlap with programs funded with treatment dollars. As long as definitions are not standardized, operationalized and disseminated, the real world interpretation of IOM categories remain variable and potentially contentious. The full opportunity for advancing prevention understanding and applications will not be realized.

Thus, the fundamental issue in current application of the IOM categories is the need for systematic clarification of terms for operational definitions to be used in criteria for real world application (e.g., how does one define specific populations and actually recruit participants), and for clarity in the implications of these categories for intervention design and implementation (e.g., what are the criteria for determining whether a program is appropriate for a given population).

Currently, the most widely applied criterion for identifying universal, selective and indicated interventions is simply the type of population to which an intervention has been delivered. Thus, a universal intervention is one delivered to a universal population – with no independent criteria for whether it is suitable for this population. A failure to clarify will allow confusion to continue, and will eventually lead the field to move on to yet another conceptual framework without realizing the significant contribution that the IOM model can bring to policy, practice and research in prevention.

PROMISE AND FUTURE DEVELOPMENT OF THE IOM FRAMEWORK

The IOM framework provides a fertile conceptual base for advancing thinking about the continuum of prevention activities. It guides the conceptualization of fitting participant needs with intervention design and implementation. To date, however, this promise has not been realized. The purpose of this section is to begin to explore the major implications of the universal, selective and indicated categories for concrete issues related to: a) defining populations, b) recruiting prevention participants and providing access to interventions; c) designing and selecting appropriate interventions; and, d) identifying appropriate outcomes.

- Defining the Population. The IOM framework identifies categories of populations that are defined broadly by assumptions concerning their risk for substance abuse. If the potential of the framework for guiding prevention planning and implementation is to be more fully realized, it is important to clearly identify and define universal, selective and indicated populations, and to relate them to recruitment and intervention design.

- Recruiting Participants and Providing Access to Service. Once population criteria are identified, intervention implementers must develop procedures for accessing the population and recruiting appropriate participants. This is a key implementation issue that must be addressed if the IOM framework is to fulfill its basic purpose of matching participants to interventions.

- Designing and Selecting Appropriate Interventions. Prevention interventions are currently assigned to IOM categories largely because of the populations to which they have been delivered. Clarifying how and why specific characteristics of policies, programs and practices are more appropriate to specific IOM categories will be a major step in improving the utility of the framework for decision making.

- Specifying Appropriate Outcomes. One of the complexities of prevention research is identifying outcomes that are appropriate for a particular intervention and population. One issue is identifying outcomes that are achievable within time frames that are short enough to provide meaningful feedback to program planners, funders and implementers. The IOM framework provides a potentially useful format for identifying useful outcomes for different population categories and interventions.

Clarifying the meaning and implications of the IOM categories in these ways is an important step in making the IOM framework more useful to practitioners. The following discussion provides a

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systematic assessment of these questions, which have gone largely unexamined in applications of the IOM framework, to date.

Universal Prevention

Universal substance abuse prevention has become highly visible in schools and communities. Public information campaigns sponsored by governmental agencies, and even the alcohol industry itself, caution the public around the safety, legal and health dangers of substance abuse. School children receive ever-increasing exposure to a range of substance use prevention in the classroom, beginning in the elementary years and progressing through high school. Other policy and social campaigns are aimed at community environments with the intent of reducing access to substances that may promote problem use, or of altering behaviors and traditions that may be accepting or supportive of problematic substance use. Unlike other IOM categories, in universal prevention recipients are not targeted by explicit criteria that would differentiate them by their relative risk for future development of substance abuse. The following discussion articulates some of the typically unexamined implications of this broad definition.

Universal Population Definition

Because they are not selected according to risk characteristics, universal populations are commonly characterized as "low" or "average" in risk. Closer consideration of the universal category leads to two important elaborations of this characterization. First, the assumption of "average risk" is less important than the fact that risk is not specifically known, and that it may be highly variable. Universal populations often include both very low risk and very high risk members. This means that the impact of a universal intervention may vary significantly across sub-populations. It may even be positive for some subgroups and negative for others. This is a critical potential issue in universal prevention that is typically not considered. It is more accurate to characterize the risk in universal populations as "unknown" and "variable" than as "average," or certainly, than as "low."

Second, even though risk is not explicitly considered in defining universal populations, these populations are delimited. There are multiple options in criteria for sub-setting a population, such as accessibility, or life stage (e.g., adolescence) or ethnic community. For example, the following four criteria (or circumstances) commonly define universal populations.

• 	Geography may define a community population (e.g., state, city, neighborhood).

• 	Demographics define many sub-populations that receive universal interventions (e.g., age, ethnic/cultural membership, gender).

• 	Setting is an important definer of sub-populations. School is the most pervasive setting in which focused universal prevention is delivered, but workplaces and communities are other examples. The unique thing about setting as a definition is that it creates a specific structural environment within which the population interacts.

• 	Relevance is a less obvious definer of universal populations. Universal messages may be delivered broadly, but be relevant only to a sub-population that is defined by a circumstance 	that makes the message relevant to them, but not to others in the population. For example, 	messages concerning designated drivers are relevant only to those who are potential drivers in 	circumstances in which alcohol is involved.

Although these criteria for defining universal populations are typically implicit or determined by convenience and opportunity, they still have important implications for intervention strategy and

effectiveness. First, the way that a universal population is defined may shape the opportunities and requirements for effective interventions. For example, the effectiveness and efficiency of a particular prevention message will depend on the proportion of the receiving audience to which it is relevant. Second, it is possible that the same criteria that define a universal population when applied with no consideration of relative risk, may define a selective population if the criteria is used because of a demonstrated relation to risk. For example, a school may be a universal population when served because of criteria unrelated to specific assessment of risk (e.g., a state requirement); but be a selective population when identified according to specific risk criteria (e.g., community disorganization, poverty). More careful attention to the actual make-up of universal populations and to the circumstances that actually define their scope is important to making decisions about universal policies, programs and practices in actual applications.

Universal Recruitment of Participants and Access to Interventions

Formal recruitment is not typically an issue with universal interventions since all members of the defined population are participants, by definition, though consent may be necessary in some cases. However, lack of attention or the ability to avoid participation is a major access issue. Many interventions (e.g., many public information messages) will not reach all members of the population, and lack of attention may impact receipt of a message. Information campaigns that require participants to actively access information (e.g., pick up and read brochures) are examples of one extreme in which universal availability will be strongly filtered by self-selection. At the other extreme, school prevention programs are an example of limited opportunity for self-selection. The degree of potential self-selection has important implications for understanding who the meaningful intervention participants may be, and as noted below, the ability to self-select can improve relevance of the message. Making the message available to a universal population does not equate to receipt of the message, or desired behaviors.

Culture is an example of unintended selection issues that must be considered in universal prevention programs. Research has shown that cultural sensitivity has a large impact on the degree to which participants perceive prevention messages to be meaningful and relevant (Chipungu et al, 2000; Springer et al, 2004). Incorporating cultural meaning into heterogeneous messages, particularly those aimed at individual behavioral change, is important to achieving equal access.

Designing and Selecting Universal Services and Approaches

The appropriateness of the design or selection of a universal policy, program or practice should be justified by a plausible explanation of why planned activities will produce desired outcomes. The IOM framework can help classify different universal interventions according to the general mechanism through which the intervention is expected to impact behavior. Table 1 provides a set of examples of universal interventions that are arrayed along continuum of change approaches ranging from controlling negative behaviors to promoting positive behaviors, and with interventions aimed at promoting awareness of risks or protective behaviors in between. The display also distinguishes between universal interventions in which there will be low or high opportunity for self-selection into or out of the intervention.

Table 1:		
Cautions in Applying Universal Policies, Programs and Practices		
	Low Opportunity for Self-selection	High Opportunity for Self-selection

Control Behavior/ Opportunity for Risk	E.G., environmental policies such as price increases, marketing controls, school policies such as zero tolerance x *Potential for unintended consequences for low risk members* x *Low effectiveness for most relevant subpopulation*	E.G., environmental policies such as use ordinances, nuisance location enforcement x *Limited scope of impact* x *Displacement rather than reduction of problem*
Promote Awareness of Risk	E.G., school-based education x *Iatrogenic effects* x *Potentially low behavioral impact* x *High opportunity cost*	E.G., media campaigns concerning health, legal, social risk x *Iatrogenic effects* x *Potentially low behavioral impact*
Promote Awareness of Protection	E.G., school-based social norms programs x *Potentially low behavioral impact*	E.G., media campaigns promoting positive actions such as designated drivers x *Potentially low behavioral impact*
Promote Protective Skills/ Protective Opportunities	E.G., full school reform programs, school-based behavioral skills programs, positive youth development programs	E.G., comprehensive community health and wellness programs, positive youth development x *Does not reach high risk/high need youth*

The top of this continuum references universal policies, programs and practices aimed at putting constraints on behavior, and that would be categorized as "environmental" in the current language of prevention. These policies, such as price increases, enforcement policies, public use ordinances, or zero tolerance policies in schools are designed to constrain access and increase sanctions to deter substance abuse. Most of these policies have low opportunities for self-selection by targeted populations, although some, such as campaigns to close or constrain nuisance bars or other locations, can be avoided by individual users. In selecting these policies when there is low opportunity for self-selection, there are important considerations that follow directly from the fact that universal populations are heterogeneous. These policies may have significant unintended consequences for low risk components of the population. For example, non-problem drinkers may be more sensitive to price than problem drinkers, and price increases may compel them to forego social drinking. Conversely, price increases may not impact use rates for dependent or high risk drinkers. Another area of concern with setting-based universal approaches that emphasize punitive control (e.g. zero tolerance school policies) is that they actually work counter to the school connectedness that has been shown to be a consistent positive contributor to reduced substance use and other positive youth outcomes (Drug Policy Alliance, 2005; Sambrano et al, 2005; Sale et al, 2002). Control-oriented environmental policy that can be avoided by problem users may result in the well known phenomenon of problem displacement rather than net reduction – problem users and their hot spots are simply moved from one location to another.

Universal programs aimed at increasing awareness of risk and awareness of protective skills or opportunities are in the center of the continuum in Table 1. These approaches are similar in assumptions about effects on behavior, but differ in encouraging avoidance or adoption. For example, a media program emphasizing legal consequences of drinking and driving increases awareness of risk, and a "designated driver" campaign emphasizes protective behavior. These approaches include programs such as school prevention curricula and public media campaigns. In simple application, they reflect a theory of change commonly summarized as the KAB theory, standing for knowledge-attitudes-behavior. It is assumed that improved knowledge will lead to changed attitudes and that this will lead to altered behavior.

Research has demonstrated that this assumption is invalid if behavioral change is the direct intended outcome. Nonetheless, information intended to build awareness is a big part of universal prevention interventions, and while it does not have a strong direct relation to behavioral change, it may play a

critical part in complex understandings of the change process. For example, awareness messages may play a role in creating receptiveness for behavior change, and have a viable role in the early stages of theories of change such as the transtheoretic model (Prochaska, J. et al, 1994). Properly formulated, messages may help move recipients in need of change from pre-contemplative, or contemplative stages toward actual behavior change.

Universal awareness messages, particularly those delivered community-wide, may also be relevant to theories of change that focus on capacity building, or community attitudinal, behavioral and policy norms, as contextual conditions important to changing substance use and associated problems. Universal messages may contribute to the readiness of a community to undertake prevention, and be a motivator to support more direct influences on behavior (e.g. policy change). The major point is that universal prevention mechanisms must be assessed with a clear understanding of their realistic outcome objectives within a well developed plan for achieving longer term goals.

Studies of universal interventions focusing on education and awareness have raised evidence-based concern about the potential iatrogenic effects of universal interventions, particularly for youth. A recent study of an ONDCP national media campaign identified a potential harmful impact on the initiation of substance use for pre-teens and adolescent females (NIDA, 2006). Studies of informational programs concerning substances have raised concerns about potential increases in experimentation by young participants (NIDA, 2006). The implication is that heightened awareness for youth in the experimental ages may actually increase the motivation to initiate use.

Universal interventions designed to promote protective behavioral skills and provide opportunity for positive behaviors are at the bottom of the continuum in Table 1. These strategies are consistent with prevention planners who argue that universal prevention should focus on physical and behavioral health promotion more than on specific strategies of prevention. In universal prevention for youth, this perspective is often articulated through positive youth development strategies. These strategies focus on promotion of protective factors, positive alternative activities, and creation of opportunities for development of these skills through interacting in a positive social environment. Advocates of this position argue that the theories of change, the empirical evidence, issues of population heterogeneity, and issues of equity all support making promotion—particularly positive youth development—the focus of universal prevention. A particularly promising approach is full school reforms that restructure school disciplinary policy, governance and classroom procedure to emphasize guided opportunities for positive youth development (Schaps & Solomon, 2003). This positive promotion approach is less prone to iatrogenic effects, unintended consequences for low risk participants, or to self-selected nonparticipation by high risk targets than are the universal interventions that are higher on the continuum. These approaches also focus more clearly on evidence-based practices that have been shown to positively impact behavior.

Appropriate Universal Outcomes
The typical approach to specifying outcomes for substance use prevention initiatives, including universal initiatives, is to focus on behavioral indicators of incidence and prevalence of use of different substances. A primary issue with respect to outcomes for universal interventions concerns the reasons that use, itself, is considered problematic; this, of course, will vary by substance. Reduction in average use across whole populations may be reasonable outcome indicator for substances that are deemed to be illegal, or that have egregious health consequences.

However, when the concern is primarily with associated consequences related to the degree of use (e.g., car crashes, sclerosis, school failure, etc.), or the circumstances of use (e.g., recreational

accidents), the applicability of average use as a primary outcome is questionable. More focused measures of harm may be necessary.

Universal interventions focusing on education, awareness or health risk messages often use measures of attitude as an outcome indicator. Indeed, some of the initial model prevention programs in NREP achieved model status based on demonstrated change in attitudes related to substance use, or health and other risks associated with use. Research has demonstrated that intervention-induced attitude change is not related to behavioral change, and interventions that produce positive attitude change do not produce behavioral change (SAMHSA, 2002). Awareness outcomes such as attitude change, increased knowledge, or modification of belief may show progress toward early stages in theories of change, but they should not be used as surrogates for behavioral change.

The above discussion raises clear concerns with respect to the adequacy of indicators of substance use or substance use attitudes as the primary measures of outcome for many universal interventions. For interventions focused on harms that are attributable to specific patterns of use in sub-populations (e.g. car crashes), the better measures would be those that are sensitive to the ultimate outcome of interest. Average use measures, for instance, will reflect reductions in legal drinking that are not associated with the ultimate outcome. For universal interventions that are intended to strengthen awareness or motivation to initiate more specific prevention activities, the appropriate measures would be those associated with increases in readiness or capacity.

Discussion

Universal prevention is widely applied, and provides highly visible rallying points for stakeholders who desire to make a public statement against substance use and the harms it brings to youth, families and society. Universal prevention has a strong common sense appeal and a history of association with the reduction of tobacco use in this country. However, tobacco use is a special case of substance use in that it is legal, widespread, and has serious and relatively uniform health risks for smokers. This brief review of issues related to universal prevention for other substances demonstrates the complexity of that concept, and indicates the potential utility of conceptually unpacking the term "universal prevention."

This family of interventions is distinct from the selective and indicated categories because need as indicated by risk or symptoms is not considered in determining who will receive services. The distinguishing characteristic of these populations is not low risk, but varied risk. This variance in risk of recipients contributes to many challenges in assessing the impact of universal interventions that are designed to control (prevent or reduce) specific negative behaviors. Studies of universal interventions aimed at increasing awareness have raised concerns that informational interventions may actually stimulate curiosity and experimentation, especially in relatively low risk, young population members.

The diversity of universal interventions requires careful distinctions between differing approaches within this category. Application of universal interventions will require identifying strategies based on appropriate expectations of change within comprehensive approaches, such as changing social acceptance and supporting awareness that will increase readiness and capacity to implement more direct prevention activities. Approaches that promote positive skills and provide environments supporting positive opportunities are strong candidates for appropriate universal prevention.

Selective Prevention

The selective category is the most direct application of Gordon's insight that known risks for developing the health condition can help preventive interventions. In fact, the selective category is the

only one of the three in which risk is explicitly applied as a criterion for selecting participants into interventions. Using shared risk factors as indicators of need is expected to have three major advantages for applicable groups. First, it should simplify identification and recruitment processes, as there is no need to conduct individual diagnoses. Second, it should help design services so that they are efficiently delivered to persons with similar prevention needs. Third, it should help develop evidence-based interventions that are more effective because they can be designed and tested for participants with shared intervention needs. Many of the cautions that issue from the diverse risk profiles of universal populations will disappear in well-defined selective populations.

In prevention, the conceptualization of selective populations is consistent with the growth of the risk framework for understanding the initiation and progression of substance abuse, particularly among young people. This risk framework has widespread credence and research support in prevention, and it supports the proposition that identifiable risk factors have a substantial relation to the probability of developing substance abuse. The great and valuable insight involved in identifying selective programming as a meaningful category for service planning and design is that there is no doubt that some individuals who share certain attributes/circumstances are at greater risk for developing behavioral health problems than others, and that these differences in risk can be identified before the disease conditions begin to manifest. Risk factors have become a predominant framework for thinking about who should receive more intensive (selective) prevention services. It is less clear that practical ways of using the risk concept to help design and deliver more efficient and effective prevention services have been successfully developed and applied. In this section, the current use of the selective category is reviewed, and directions for improving its utility in prevention planning and implementation are suggested.

Defining the Selective Target Population
The potential value of the selective prevention category lies in the way that populations are defined. A review of the application of the selective category to population definition reveals a gap between the research-based conceptualization of its applicability and the practical realities of identifying discrete populations with shared prevention needs. For example, in discussing the application of Gordon's distinctions to behavioral health, Silburn (1999) identifies the fact that the potential utility of the ability to identify selective populations depends on "… knowing something about the magnitude of various risks for a condition (relative risks) and … the proportion of the population …" that shares the risk. In application, these are demanding criteria. The risk factor research on substance abuse is typically not sufficient to precisely specify risk factors by degree of contribution to the health condition, by threshold levels of risk, or by prevalence of specific risks in the population. Measurement error is endemic to many risk factor indicators, and their relation to substance use is probabilistic. Analyses of the relation between common risk factors and measures of substance use among youth typically reveal that the increase in probability of substance use associated with individual risks is relatively small (Skager and Austin, 2004). Multivariate analyses combining multiple risks demonstrate higher increases in the probability of substance abuse, but this information becomes less practical for precisely defining populations in need of prevention service.

The challenges of precisely defining selective populations are compounded by the fact that risk factors for substance abuse have been identified in a number of categories. At the simplest level, they have been defined as internal (e.g. social-emotional, self-regulation, oppositional, attitudes, perceptions) or external risk in the youth's environment. These external risks may inhere in a variety of social contexts such as friends, family, school, community and society, or in circumstances such as divorce, job loss, or transitional age of emancipation for foster youth. Closely examined, identifying risk in each of these domains has different implications for selecting an intervention. For example, community level risk cannot be removed through an intervention aimed at individual internal states, but it can be used to

identify people who may need help in developing "resilient" individual characteristics that will help them thrive in a high risk environment.

Fundamentally, the knowledge that multiple risk factors have a complex, probabilistic relation to substance use is of limited practical value in making real world decisions about who should be actually targeted in a particular selective intervention. Similarly, interrelated risk factors, as identified in research based largely on correlations, do not provide clear direction concerning the most effective policies, programs and practices in specific applications. Too frequently, profiles of a population (e.g., a school) indicate multiple risk conditions that warrant a "high risk" categorization.

This was almost universally the case across the 48 sites in the Center for Substance Abuse Prevention's National Cross-Site Evaluation of High Risk Youth Programs. In this study, location in a low income community was the dominant shared characteristic for populations, while a variety of other factors were also predictably present. These multiple factors did provide a rationale for identification as "selective," but the interventions themselves were diverse, and were not driven specifically by intervention strategy based on specific risk. A profile of correlated risk factors simply does not provide specific guidance for specialized selective interventions.

In practice, prevention planners make decisions based on available information that can be used to easily identify higher risk youth. Common ways of identifying youth for selective programs are to focus on youth who are in high risk circumstances – troubled homes, communities experiencing social disorganization and/or poverty, or schools that are characterized by low performance or social disorganization. It is these naturally occurring high risk circumstances that are visible and accessible, and the presence of multiple risks in these circumstances that confirms, rather than guides, the appropriateness of targeting these youth as participants in selective prevention. Clearly identifying, naming, and understanding these naturally occurring selective populations is an under-explored and promising approach to defining selective populations.

Recent work in applying selective prevention has introduced the term "vulnerable populations" (Burkart, G., 2005; Springer, 2006). Examples of vulnerable populations for which interventions have or can be developed include the following:

- Homeless youth
- Young offenders
- Foster youth
- School drop-outs
- Regular participants at dance clubs
- Students experiencing academic failure

Prevention practitioners often want to serve these sorts of populations, which certainly fit the selective category. However, the professional discussion of selected prevention has not focused on how these vulnerable populations provide opportunities for definition, recruitment of participants and service access. Nor has research or professional discussion explored the ways in which the vulnerable population concept may help guide the selection of specifically tailored interventions for prevention. The next sections will elaborate the advantages of focusing on identifiable vulnerable populations as the target of selective prevention.

Recruitment of Participants and Access to Selective Services

A primary advantage of focusing on vulnerable populations is that they already exist and are clearly identifiable. Recruitment and access to many existing programs depends on finding participants that share one of multiple risks in a larger population, or on applying a category that is so inclusive that it results in very diverse risk profiles. The "high risk" label is an example of the latter. Methods of "finding" participants who meet the selective populations are often dependent on membership in broad and heterogeneous groups, such as membership in an economically disadvantaged community. Or they may use evaluative processes such as referral based on personal experience with the referred participant, typically as a parent or a teacher. These referrals are often based on relatively loose criteria related to perceived need, and are prone to bias and selection error. For example, "acting out" has been identified as an overrepresented criterion in teacher-driven referral processes.

The multiplicity of risk factors available for recruitment purposes is a double-edged sword. On the one hand, youth at higher risk for substance use for some reason can be readily identified using a variety of information. On the other hand, the probabilistic correlation of risk to harm, the lack of specific knowledge about the relation of single indicators to substance use, and lack of strong clustering of specific risks in many selective programs means that the potential power of selective programming to identify participants with similar need, and to guide effective intervention design, is not realized.

A focus on existing vulnerable populations can greatly increase the similarity of risk and need among program participants and provide guidance related to need and opportunity for effective intervention. For example, vulnerable populations are typically tied to a particular setting. Foster youth can be accessed in the foster care system, young offenders can be accessed through the juvenile justice system, and regular club participants can be recruited through the clubs. Outreach and recruitment processes can be tailored to the natural setting in which the vulnerable population can be accessed. Criteria for referral or publicizing opportunities can be incorporated into intake or case management procedures in foster care, the criminal justice system, or in the counseling offices of schools. Another advantage of focusing on vulnerable populations is the ability to identify opportunities for effective intervention. This includes both the ability to identify commonly occurring negative outcomes for this population, specifying the role and prevalence of substance abuse in the population, and identifying opportunities for creating support and opportunity for prevention activities (e.g., training in the foster parent system to support foster youth). These important implications of recruiting will be elaborated in the following section on intervention design.

In recruiting vulnerable populations, practitioners must take care in carefully selecting their intervention services. The risk literature tells us the following: a) that vulnerable populations are not homogeneous, i.e., it can not be assumed that all participants have the same needs; and b) risk research demonstrates co-occurring problems, but less is known about causation.

Designing and Selecting Selective Services

Key questions in designing interventions for selective populations include: a) How should selective interventions be different from universal, and why?, and, b) What are the important differences in services that will meet the needs of different selective groups and what is the basis for these differences? Some universal strategies such as media campaigns are clearly distinct from selective strategies, though this is not always the case. As noted in earlier sections, interventions offered to selective populations, in school-based programs for example, are often identical to those used for universal populations. The following discussion explores what is known about content in effective selective interventions with the intent to differentiate them more clearly from universal interventions.

First, selective programs will emphasize direct services to populations, typically in smaller groups than are associated with universal applications. For programs that serve youth in school settings, students who are perceived to be at elevated risk are served outside the normal classroom in smaller groups.

Research gives some guidance on those factors that make selective programs effective. A first requirement of effectiveness for prevention programs serving selective populations is a relatively high level of service intensity, as measured by the amount of program contact time per week. Researchers for CSAP's National Cross-site Evaluation of High Risk Youth Programs found that programs averaging more than four hours of contact per week were more effective in achieving substance abuse prevention outcomes than those with less contact (Springer et al, 2004). Selective program designers should plan for more intensity than involved with universal programs.

CSAP's National HRY Evaluation also produced conclusions about the content and mode of delivery that is effective in programming for selective programs. Those programs that: a) included a focus on protective behavioral skills rather than information; b) relied minimally on didactic instruction; c) used group tasks involving cooperation and building connections to the group; and, d) incorporated exercises involving reflective learning were more effective in reducing substance use relative to comparison groups (Springer et al, 2004). The first two of these characteristics are similar to those that research has associated with more effective universal in-school programs that promote protective behaviors. While the line between principles of effectiveness for selective programs is not a step change from the more similar types of universal programming, research is demonstrating important and consistent differences in emphasis that appear to apply across vulnerable populations. This growing research also demonstrates that the characteristics of effective prevention for selective populations require more time per week and more loosely structured activity that can typically be accomplished in classroom programs. Selective programs for youth work best in after-school or community-based settings.

Beyond selecting programs that are appropriate for higher risk populations, generally, program designers must determine whether the particular risks that define their participants have implications for how services should be designed and delivered. The first consideration is the alignment of risk domains, the focus of the intervention, and the design of services. A focus on vulnerable populations has great potential for helping to align prevention services to the particular cluster of need and service opportunity that characterizes a specific vulnerable group. This potential follows from the fact that vulnerable populations exist prior to the intervention.

They are not groups of youth that are created through a selection process based on multiple, discreet risks. As depicted in Table 2, vulnerable populations can be described according to features important to designing preventive interventions, and close consideration of these characteristics can provide a guide to tailoring selective interventions to specific groups of participants. Table 2 is an overview example. Each of these vulnerable populations would require closer consideration of needs and opportunities in a local planning environment, but the general utility of this planning focus is evident.

Table 2:				
Vulnerable Youth Populations and Parameters of Selective Intervention Design				
Vulnerable Populations	**Setting**	**Substance Abuse**	**Priority Service Needs**	**Intervention Support**
Foster Youth	Foster care system	High risk, important intervention	Improved stability, home support, individual needs may vary	Potential continuity of service through the foster care system, potential focus for collaboration with system involved providers,

				basis for family training
Young Offenders	Juvenile justice system	High risk, important intervention	Cognitive-behavioral skills, positive opportunities, academic /vocational support	Potential supportive supervision through the CJS, potential collaboration with involved services
Low Achievers	School system	Unknown, medium, ancillary	Cognitive-behavioral skills, academic/ vocational support	School system cooperation is important to focus on this group, and to help focus program need
Club Goers	Clubs	High risk, important intervention	Harm reduction awareness, positive opportunities	Non-organized setting emphasizes need for outreach, appealing awareness information, positive alternatives
Homeless Youth	Shelters, CJS contact, Street	High risk, important intervention	Harm reduction awareness/ support, positive alternatives, supportive shelter, reintegration assistance	Non-organized setting emphasizes need for outreach, appealing awareness information, supportive and accepting alternatives, counseling and group opportunities
School Drop Outs	Community, difficult access	Unknown, high, ancillary	Positive alternatives, vocational/ academic support, cognitivebehavioral skills	Non-organized setting emphasizes need for outreach, appealing awareness information, supportive and accepting alternatives, counseling and group opportunities

The display in Table 2 demonstrates how identification of an example vulnerable population can help guide consideration of important planning issues. Understanding the setting provides guidance concerning recruitment and access, potential collaborators, and opportunities for effective intervention. The need and opportunity to focus on skills and continuity of foster families, or the utility of criminal justice mechanisms (such as juvenile drug courts) to provide supervised support, are examples. Focusing on these existing populations also allows specification of the priority negative outcomes experienced by these vulnerable youth, and assessment of the degree to which substance use is a known contributor, or an ancillary concern, with respect to these priority negative outcomes.

Cultural differences provide an important example of the need for tailoring prevention in selective applications. Research has shown that cultural content increases participants' perceptions that services are meaningful (Chipungu et al, 2000) and some programs that fully incorporate cultural content into the intervention design have been found to be more effective in achieving outcomes for participants than programs that do not incorporate that content (Springer et al, 2005).

In practice, providers do recognize that the specific risks that characterize their selective participant population may require special attention, but there is little explicit programmatic guidance through model programs or other mechanisms for exactly what the important risk distinctions and appropriate responses might be. There are many plausible considerations. Participants who are at risk primarily because of individual characteristics may benefit more from programs that focus fundamentally on their individual skills, or, in some instances, more from therapeutic programs. Youth who initiate use out of a propensity to risk-taking or pleasure-seeking, for instance, may require quite different interventions than those who use out of social insecurity. Participants with risks that inhere largely in the environment may benefit primarily from programs that create opportunity for them to participate and achieve in more positive environments. The close analysis of prevention needs and opportunities

within vulnerable populations is a potentially strong tool that can help prevention planners adapt evidence-based policies, programs and practices to specific selective applications.

Appropriate Selective Outcomes

Current practice in evaluation or performance monitoring for selective programs is very similar to that for universal programs. Outcome measurement focuses on substance use type, prevalence, frequency and amount. These indicators are more appropriate, informative and useful for selective intervention than for universal because selected populations are more likely to already have initiated use and are further along a presumed trajectory of risk for abuse. In universal programs, it is often difficult to assess the success of the program in slowing initiation or reducing progression of use because of low base rates and small normative increments. For selective programs, the relevant variance in substance use is higher and actual reductions in use are identified in many programs (SAMHSA, 2002).

In addition, programs often measure change in risk or protective factors. While risk is the basis for recruitment to selective programs, reduction of risk is often not an appropriate outcome indicator. For example, if participants are selected into a youth program on the basis of community disorganization, poverty, family problems, or even school performance, there is probably little opportunity for the program to directly and significantly change those conditions. The alternative is to identify protective factors that will equip participants to cope more effectively with those risk conditions. These protective factors are appropriate and useful outcome indicators of selective programs if those programs have clearly articulated expectations of change that specify how the protective factors address the risk and how the actions of the program are expected to produce the protective factors. In the large sense, this logic is widely expounded by prevention professionals in the language of resilience and protection. However, in the practice of specifying protective factors as outcomes, the lack of clearly articulated expectations for particular selective populations reduces both: a) the validity of the indicators with respect to informing practice, and b) the probability of finding a positive result. Research has shown that when multiple risk and protective factors are measured in focused selective interventions, the observed positive change is greater for indicators of the factors most directly addressed in the intervention (Springer, Wright & McCall, 1992). The stronger the theory of change (logically and empirically) that specifies protective factors as both: a) a plausible outcome of the intervention, and b) a mediator of substance abuse, the more valid and useful that outcome is for evaluating or monitoring the performance of selective programs. Focusing on vulnerable populations and understanding their experience before specifying outcomes and designing interventions will contribute to both achieving outcomes and measuring intervention success.

Discussion

Selective interventions are delivered to populations that share identified risks for substance use. The premise of the original construction of the IOM concept is that the higher level of shared risk is an indicator of need for greater service. In the health setting it was assumed that the higher level of risk was sufficient to indicate the nature of the necessary service without diagnosis of the internal etiology of the disease condition in individual cases – the individual could be treated as a black box. The very large number of risk factors identified concerning the epidemiology of substance use, the fact that these risks can be categorized in a number of different domains, the low correlations between risks and substance abuse, and the questionable attribution of cause for many of these risk factors makes the application of selective logic to substance abuse prevention more complex.

Recruitment of selective program participants is often based on widely shared factors such as residence in a disorganized, high risk community or on loose procedures such as teacher referral. The result is that many selective populations are quite heterogeneous with respect to their specific risk

profiles. The ability to meet the specific needs of members of selective populations, particularly those that have distinctive patterns of risk, is often not part of the program. Further research and guidance to practice regarding appropriate screening and recruitment and concerning the specific practices that are more effective for selective populations and particular risk groups is needed. Increased attention to vulnerable populations will contribute to meeting these needs.

INDICATED PREVENTION

Indicated prevention serves the individual screened for early problems associated with substance abuse. These "signs or symptoms" may be related to substance abuse behaviors themselves, or to problems that are associated with substance use. Formally, the distinction between these "minimal but detectable" signs and a clear cut need for substance abuse treatment is that they are insufficient to warrant a DSM-IV diagnosis of dependence.

Providing prevention services to indicated participants is arguably the most neglected service area among the three IOM categories. The reasons are several. First, indicated prevention services are at a point on the IOM protractor that has a long history of professional and institutional tension. Developing a smooth integration and continuum of service from prevention to treatment has been difficult in the behavioral health field. Funding of these portions of the service continuum has come in separate, categorical streams, and competition for funds within the prevention field has tended to limit funding of indicated populations, which are often identified as in need of treatment. The field of substance abuse services is in a long debate about how prevention and treatment should be integrated. Indicated prevention is a critical part of that discussion.

Second, indicated prevention is relatively demanding to deliver. Indicated services often combine individual and small group delivery, involve specific investigations of particular behaviors and issues, and require at least partial involvement of trained therapists. Recruitment, packaging of the right services and cost can be barriers. Nonetheless, indicated services are a critical stage in the continuum of care. At the border of diagnosable dependence, indicated services offer the highest probability of getting services to those who will experience the greatest individual harm, and create the greatest social harm, as a result of substance abuse.

Defining the Indicated Participant Criteria

Similar to selective populations, indicated populations will be defined by characteristics of individuals. In practice, the emphasis on shared characteristics for selective populations and individual characteristics for indicated populations reflects a relative difference. To some extent, participants in indicated prevention interventions must share some characteristics, at least within categories. In concrete terms, the population definition issues for indicated interventions include a) the explicit definition of the types of criteria that are used for selection, and b) the nature and strength of that relation to substance abuse.

Definitions of indicated populations vary from those "specific individuals with known, identified risk factors that place them at higher than average risk for developing a problem or disorder…" (State of Rhode Island, 2005) to definitions that specify the population should display "detectable signs or symptoms suggesting a disorder…" (Robinson et al, 2004). There are important similarities in these definitions. First, there is clarity that the condition to be prevented is progression to a diagnosable "disorder." For substance abuse prevention, that means a DSM-IV diagnosis of dependence or abuse. Put differently, indicated prevention is not designed to prevent initiation or use – it is designed to prevent dependence and associated harms. Second, it is clear that the defining indicators will have an established correlation with substance abuse that is stronger than what is typically found for indicators

that suffice for selective populations. Third, it implies the need and use of a 'screening' instrument, protocol or procedure, or some type of formal screening, to identify individuals at risk.

Other factors are less clear. Some definitions specify that "risk" for indicated populations includes cooccurring problems, which may include school failure, justice system involvement, health or mental health problems, violence or aggression, or direct consumption issues such as binge drinking or substance use violations. In addition to being more strongly correlated with harm, these indicators are different than those for selective programs because they are all individual factors – family, peer or community level indicators are not adequate for identifying indicated participants.

Recruiting Participants and Providing Access to Indicated Services.
Recruiting indicated program participants requires an individualized screening process. The purpose of the recruitment process is to identify those individuals who are in need of focused and relatively intensive interventions to prevent progression to dependence and/or to severe harm. There are three major potential avenues of recruitment.

First, self-referral is an option for many indicated programs. Members of indicated populations may already be experiencing negative personal consequences such as black outs, disapproval of friends or family, criminal justice involvement, regret, depression, or guilt. Outreach information letting them know that help is available may be enough encouragement for some potential participants to selfrefer. Second, referrals may be made by teachers, counselors, administrators, parents, or even peers (e.g. co-workers). Outreach criteria may be provided as guides to secondary referral. Third, other initial screening processes may be used, such as automatic referrals for students involved in violence, substance possession or other relevant infractions. In the work place, alcohol use on the job or chronic absenteeism may be criteria for further screening.

Indicated programs will typically require additional diagnostic assessment after an initial positive screen. Brief screening and diagnostic instruments are important tools for indicated programs to ensure that high need participants are recruited.
The demands of recruitment for indicated populations limit the environment in which indicated programs operate. The recruitment process is typically contained in an institutional setting such as a school, a work place, the criminal justice system, or a health or behavioral health provider. The institutional setting provides the focused involvement necessary for effective outreach, referral based on behavior, motivation to participate, and the ability to facilitate participation in relatively intensive interventions.

Indicated populations can be defined narrowly based on a single criteria (e.g. threshold rates or patterns of substance use), a narrowly focused cluster of indicators (e.g. behavioral, criminal justice, or other indicators directly related to substance use), or a broader set of indicators focusing on multiple, or more loosely related problems (e.g. substance use, acting out and violence, school failure, date rape). The decision about how widely to screen in a particular setting has very important implications for service and evaluation. When an indicated program is put in place in a particular setting, there is a motivation to use it to meet a broad range of serious issues that are experienced by members of the setting. Furthermore, since membership in indicated populations may be relatively rare in many settings, a broad recruitment net may be necessary to meet capacity. It follows that multi-problem screening into indicated programs is typical in settings where rates are low and multiple issues are of high concern (e.g. schools). In settings where populations may be larger and specific problems of substance use are more prevalent (e.g. some work places), more focused criteria for identifying indicated populations may be appropriate.

Designing and Selecting Indicated Services and Approaches

In contrast to universal and selective prevention, there are relatively few models for indicated prevention policies, programs and practices. The most common forms of indicated prevention are student assistance programs (SAPs) in secondary education schools and institutions of higher education, employee assistance programs (EAPs) in places of employment, and juvenile diversion programs and community placement programs for juveniles. These programs typically use a mix of facilitated group sessions, individual services, and a variety of support services and resources. Facilitated group sessions include skills development, discussion and support groups. Individual sessions are often provided through integrated services in which counselors or therapists are brought into the program to meet specific needs. Referral to external agencies is another way of providing needed services.

One issue in providing indicated prevention through assistance programs or other mechanisms is how to adequately intervene for the multiple, relatively serious issues that may bring an individual into the program. While substance abuse may be highly related to the associated problems that youth bring into a program, it is not necessarily the root problem – it may be a symptom of another problem, or a co-occurring problem issuing from another root cause. When individuals are being admitted to the program because of serious co-occurring problems, it is important to ensure that appropriate services are available that are relevant to each of the conditions that may produce serious negative consequences for participants. Thus, indicated programs that serve many specific indicated problems undertake the responsibility to serve multiple problems. The link between recruitment criteria and services is critical when those criteria are for serious symptoms or conditions that present high risk for impending harm. The role of group services for diverse participants in indicated programs is another central issue for designing indicated programs. In existing indicated programs, group processes are often used to promote reflective learning situations similar to those found to be effective for selective programs.

Specifying Appropriate Outcomes

Outcomes for indicated interventions should differ from those of universal and selected programs in important ways. First, outcomes of interest concerning substance use should include reduction of use where necessary, and particularly, reduction of use of particularly harmful or problem substances such as binge drinking or illicit drug use which carries risk for criminal justice involvement. While these kinds of outcomes are low rate among universal and many selective populations, indicated populations are partly selected on the basis of high probability of these heavy use patterns. They are central to performance monitoring or evaluation in indicated programs.

Second, the indicated programs should include outcome indicators of the serious co-occurring or individually occurring problems that are indicated through the multiple criteria that are part of the screening process. While the rationale for universal programs is diffuse, including general objectives of positive youth development, the rationale for the more intensive and expensive services provided in indicated programs is specifically that it will prevent the progression of specific negative behaviors and the specific negative consequences.

Discussion

Indicated interventions are the last stop for prevention services to individuals who are close to the threshold of the development of a "disease" condition. In the relatively more determinant world of physical health, this may mean the early manifestations of the symptoms of a progressive disease. For substance abuse this may mean experiencing some of the behavioral or consequence symptoms that are part of a DSM-IV diagnosis. It may also mean experiencing harms that are associated with substance use in the larger population. One issue in application of indicated logic to substance use is

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that the association of individual serious issues in a larger population does not mean that they are associated in the persons that participate in the indicated program.

Indicated interventions are a relatively neglected component of prevention. The reasons are partly institutional since indicated prevention is at the margin of services that may be eligible for different funding pools (prevention or treatment). Indicated prevention may also be less useful as a public statement against substance use by school administrators or community decision makers. Although assistance programs have had strong support from some stakeholders, there is not a lot of attention to systematically developing and testing different approaches to delivering these services.

WORKING WITH THE IOM FRAMEWORK: SEPARATING HUBRIS AND OPPORTUNITY

The ultimate value of the IOM categories is the provision of an encompassing and analytically useful framework that helps prevention policy makers and practitioners relate our growing knowledge about substance abuse epidemiology, etiology and preventive interventions to the practical issues of service delivery, including cost, effectiveness and decisions about who should be served in what ways. The framework is important in several ways.

First, it provides a context for understanding the complexity of the overall prevention enterprise, making it clear that no one strategy or approach can effectively address the manifold contextual and individual factors that produce substance abuse and its related harms. For example, short of clear empirical confirmation, arguments that one "school" or "approach" to prevention should replace others is a reflection of stakeholder hubris or self-interest.

On the other hand, the logical rigor that comes with categorizing programs according to careful analysis of who and what is being impacted, closely examining the delivery of the service, and articulating expectations of change, provides a strong basis for thinking through what "makes sense" in a given action context, even when empirical evidence is weak. Evidence-based practice benefits greatly from the conceptual and analytic side of scientific inquiry even when definitive data is not available. It would, for instance, guide decision makers in realizing that a low rate problem, such as meth use among youth, will not be substantially impacted by a media campaign. Indeed, clear thinking is often a superior guide to weakly conducted empirical investigation. The IOM framework provides a strong resource for clear thinking.

Second, the inherent logic of the relation between specific interventions and specific populations and outcomes clearly demonstrates that different interventions address different portions of a complex social and behavioral set of issues. No one intervention point is sufficient to addressing the full range of issues, and because the components are linked probabilistically, no one set of factors determines the others. For example, the IOM framework provides a way of thinking about and categorizing "environmental" versus "direct service" policies that clearly demonstrates that they are complements rather than mutually exclusive alternatives. They address different populations with different theories of change. Local action or ordinances that focus on closing or controlling "problem establishments," for example, have the objective of changing opportunities to use alcohol publicly, not to change individual behavior. Specifying the nature and appropriate outcomes of different interventions within the IOM framework will clarify how they are complementary. In sum, the IOM model helps show that different categories of service do not necessarily compete, but are complementary components towards creating a system of prevention that includes both building the capacity to design, implement and support prevention activities with development of positive orientations and behaviors; and the reduction of substance abuse, and/or reduction of specific harms related to use.

Third, the IOM framework can be useful in thinking through the details of intervention design and implementation. Because it structures the specification of relations between an intervention, the characteristics of the population, and the intended outcomes, the IOM framework can greatly enhance articulation of the logic of an intervention. By providing a perspective that helps clarify the relation between real world circumstances and prevention concepts and practices, the IOM framework holds promise for furthering the application of research-based knowledge to prevention practice. Focusing on known vulnerable populations to design selective policies, programs and practices is a prime example.

In summary, the IOM framework has great potential for helping to strengthen substance abuse prevention. Carefully applied, it can be a valuable aid to thinking through the design of interventions, to selecting from existing interventions to meet a particular set of requirements or objectives, and to identifying the necessity for and design of comprehensive projects that meet a complex set of needs with multiple, complementary interventions. The IOM framework is also a useful lens through which to observe existing research findings and methods, to enrich their interpretation, and to plan future investigations that build on past findings and fill important gaps. Less positive, the review highlights the current underutilization, and even misapplication, of the IOM insights. Categories are often simplistically defined and used as tallying points for advocacy, rather than careful and considered decision making. Labels are used to market particular programs or approaches with little evidence that they are most appropriate for those approaches. And, most important, many of the important issues that are raised by the careful assessment of programs and activities within each category are not seriously addressed. The greatest danger is that the failure to use the model to its full advantage will contribute to undervaluing its potential contributions, and eventually to its premature abandonment. Hopefully, this review may help identify the promise of serious and in depth application of IOM insights for substance abuse prevention.

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